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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,961	03/11/2004	Thomas Geehan	05542/040001	6276

7590 03/27/2007
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EXAMINER

THORNEWELL, KIMBERLY A

ART UNIT	PAPER NUMBER
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2128

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/797,961

Applicant(s)

GEEHAN ET AL.

Examiner

Kimberly Thornevell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/11/04 7/14/05
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. Claims 1-34 have been presented for examination.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 3/11/2004 and 7/14/2005 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 17 and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 17 and 29 disclose performing the plurality of fracturing simulations using a deterministic fracturing simulator. However, respective independent claims 1 and 18 recite performing the simulations stochastically. The deterministic simulator has not been enabled by the Applicant's disclosure. Furthermore, it appears that claims 27 and 29 disable their respective independent claims by using a deterministic simulator as opposed to a stochastic one.

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5. Claims 17 and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 17 and 29 disclose performing the plurality of fracturing simulations using a deterministic fracturing simulator. However, respective independent claims 1 and 18 recite performing the simulations stochastically. The Applicant's disclosure does not sufficiently describe the details of the deterministic simulator and how it works with probabilistic inputs (distributions).

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 5, 14, 15, 17, 26, 27 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 5 recites performing a risk assessment analysis to determine a value of a particular site specific datum with respect to "increasing operational assurance." The Applicant has not set forth what this is an assurance of.

9. Claims 15 and 27 recite a result of the numerical analysis being a "percentage certainty." The Applicant has not set forth what this is a certainty of.

10. Claim 17 recites the limitation "the plurality of fracturing" in line 2. There is insufficient antecedent basis for this limitation in the claim.

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11. Claim 29 recites the limitation "the fracturing simulation computer" in line 1. There is insufficient antecedent basis for this limitation, or for any computer, in the claim.

12. Claims 14 and 26 provide for the use numerical analysis, but, since the claim does not set forth any steps involved in the method/process of using the derivatives, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

13. Claims 14 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The Applicant has not set forth any steps as to how the numerical analysis is used.

Claim Rejections - 35 USC § 101

14. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. Claims 1-34 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 recites, in part:

"...USPTO personnel shall review the claim to determine it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the final result achieved by the claimed invention is 'useful, tangible, and concrete.'"

...b) 'TANGIBLE RESULT'

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to *produce a real-world result.*"

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Method claims 1-17 do not produce a useful, tangible, and concrete final result. The steps of the method claims do not produce a useful, tangible, and concrete result. They merely recite a software algorithm, per se, which, for example, does not display, store, or otherwise provide a useful tangible output. No practical application producing a real-world result has been set forth in the claims. Independent claim 1, for example, only recites software steps and does not produce a useful, tangible and concrete final result. The steps of determining and extracting do not produce a useful, tangible and concrete final result.

Paragraph [0030] of the Applicant's disclosure reads, in part:

[0030] Those skilled in the art will appreciate that the aforementioned components are logical components, i.e., logical groups of software and/or hardware components and tools that perform the aforementioned functionality. Further, those skilled in the art will appreciate that the individual software and/or hardware tools within the individual components are not necessarily connected to one another. In addition, while the interactions between the various components

Claims 18-34 are directed to a system comprising components and modules for determining distribution data for a disposal domain parameter in a cuttings injection process. However, because lines 1-3 of paragraph [0030] read that the components are logical groups of "software and/or hardware components," the components can be exclusively software components, therefore directed to software, per se. Note exemplary claim 18, which recites only software components. Additionally, software, per se, is not considered concrete (MPEP 2106).

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Rechard, "Historical Background on Performance Assessment for the Waste Isolation Pilot Plant," Reliability Engineering and System Safety 69, published 2000.

In addition to the specific citations below, emphasis is placed on section 8 in general of the Rechard reference.

As per claim 1,

Rechard discloses a method for determining distribution data for a disposal domain parameter in a cuttings injection process, comprising:

- Performing a fracturing simulation using a site specific datum to obtain a fracturing result (**page 35 column 1 first full paragraph, using porosity in simulations in order to achieve sampling of fracture spacing**);
- Determining a probability of creating a new fracture using the fracturing result and a probability model (**page 35 column 2 first full paragraph**);
- Performing a plurality of fracturing simulations using the probability and a distribution associated with the probability (**page 35 column 2 last paragraph**) to obtain disposal domain information (**page 36 column 1 section 8.3 first paragraph**); and
- Extracting the distribution data for the disposal domain parameter from the disposal domain information (**page 36 column 1 last**).

As per claim 2,

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Rechard discloses performing a risk assessment analysis for the site using the distribution data for the disposal domain parameter to obtain a risk assessment (**page 10 column 2 first full paragraph, also page 35 column 1 last paragraph “system characterization and hazard identification”**).

As per claim 3,

Rechard discloses determining whether the disposal domain parameter satisfies a criterion using the risk assessment (**page 10 column 2 last paragraph, determining whether the data meets requirements of 40 CFR 191; also page 36 section 8.3.2, quality assurance**).

As per claim 4,

Rechard discloses the criterion being at least one selected from the group consisting of a governmental regulation (**page 11 column 1 first full paragraph; also page 36 section 8.3 paragraph 1**) and a cost criteria (**page 38 column 2 second full paragraph**).

As per claim 5,

Rechard discloses performing a risk assessment analysis to determine a value of a particular site specific datum with respect to increasing operational assurance (**page 6 last paragraph, “performance characterization” ; also page 35 column 1 last paragraph**).

As per claim 6,

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Rechard discloses determining an operational parameter using the disposal domain information (**page 36 column 2 second full paragraph**).

As per claim 7,

Rechard discloses generating an operational parameter using the data distribution for the disposal domain parameter (**page 38 column 1 last paragraph**).

As per claim 8,

Rechard discloses extracting sensitivity study information associated with the disposal domain parameter from the disposal domain information (**page 37 column 1 last paragraph**).

As per claim 9,

Rechard discloses the disposal domain parameter comprising at least one selected from the group consisting of disposal zone selection (**page 11 section 3.1, selection of site; also page 36 column 1 last paragraph, characterization of disposal system**), fracturing length (**page 30 column 2 first full paragraph**), number of disposal wells (**page 35 column 2 last paragraph, number of boreholes/km²**), injection pressure increase (**page 27 column 2 first full paragraph, pressure-dependent creep**), and disposal well capacity (**page 34 column 1 lines 1-8, specifying volume**).

As per claim 10,

Rechard discloses the probability model comprising a probability-based decision tree comprising at least one probability value (**page 25 figure 12, page 24 column 2 second full paragraph lines 6-10**).

As per claim 11,

Rechard discloses using the probability-based decision tree comprising using the fracturing result and a formation property to determine the probability of creating the new fracture if the fracture is not closed (**page 24 column 2 second full paragraph lines 10-18**).

As per claim 12,

Rechard discloses the at least one probability value being associated with an injection zone (**page 25 figure 12a, *upper aquifer, repository, lower aquifer***).

As per claim 13,

Rechard discloses the probability value being obtained from a database of field data (**page 36 column 1 last paragraph**).

As per claim 14,

Rechard discloses extracting the distribution data from the disposal domain information comprising using numerical analysis (**page 31 column 2 first full paragraph**).

As per claim 15,

Rechard discloses a result of the numerical analysis being a percentage certainty (**page 34 column 1 second full paragraph**).

As per claim 16,

Rechard discloses performing the plurality of fracturing simulations comprising using a Monte Carlo simulation methodology (**page 36 column 1 first full paragraph**).

As per claim 17,

Rechard discloses the fracturing simulation and the plurality of fracturing being performed using a deterministic fracturing simulator (**page 38 column 2 second full paragraph**).

As per claim 18,

Rechard discloses a system for determining distribution data for a disposal domain parameter in a cuttings injection process, comprising:

- A probability component configured to obtain a probability of creating a new fracture using a fracturing result and a probability model (**page 35 column 2 first full paragraph**);
- An integration module configured to generate at least one input parameter for a fracturing simulation using the probability (**page 35 column 1 first full paragraph, using porosity in simulations in order to achieve sampling of fracture spacing**) and further configured to extract distribution data associated with at least

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one disposal domain parameter from the disposal domain information (**page 36 column 1 last**); and

- A fracturing simulation component configured to perform the fracturing simulation to generate the disposal domain information using the at least one input parameter (**page 35 column 2 last paragraph**).

As per claim 19,

Rechard discloses a data acquisition component configured to obtain data associated with the at least one input parameter (**page 31 column 1 first full paragraph**, *collected data*).

As per claim 20,

Rechard discloses a knowledge database component configured to provide the probability model (**page 31 column 2 first full paragraph**, *parameter database*).

As per claim 21,

Rechard discloses the at least one disposal domain parameter comprising at least one selected from the group consisting of disposal zone selection (**page 11 section 3.1**, *selection of site also page 36 column 1 last paragraph, characterization of disposal system*), fracturing length (**page 30 column 2 first full paragraph**), number of disposal wells (**page 35 column 2 last paragraph**, *number of boreholes/km²*), injection pressure increase (**page 27 column 2 first full paragraph**, *pressure-dependent creep*), and disposal well capacity (**page 34 column 1 lines 1-8**, *specifying volume*).

As per claim 22,

Rechard discloses the integration component being further configured to quantify the impact of geological uncertainties and CRI operational uncertainties on cuttings re-injection quality assurance using the disposal domain information (**page 34 column 1 last paragraph**).

As per claim 23,

Rechard discloses the probability model comprising a probability-based decision tree comprising at least one probability value (**page 25 figure 12, page 24 column 2 second full paragraph lines 6-10**).

As per claim 24,

Rechard discloses using the probability-based decision tree comprising using the fracturing result and a formation property to determine the probability of creating the new fracture if the fracture is not closed (**page 24 column 2 second full paragraph lines 10-18**).

As per claim 25,

Rechard discloses the at least one probability value being associated with an injection zone (**page 25 figure 12a, upper aquifer, repository, lower aquifer**).

As per claim 26,

Rechard discloses the integration component being configured to extract the distribution data from the disposal domain information comprising using numerical analysis (**page 31 column 2 first full paragraph**).

As per claim 27,

Rechard discloses a result of the numerical analysis being a percentage certainty (**page 34 column 1 second full paragraph**).

As per claim 28,

Rechard discloses the fracturing simulation component being further configured to use a Monte Carlo simulation methodology to obtain the at least one input parameter (**page 36 column 1 first full paragraph**).

As per claim 29,

Rechard discloses the fracturing simulation computer using a deterministic fracturing simulator (**page 38 column 2 second full paragraph**).

As per claim 30,

Rechard discloses the integration component being configured to perform a risk assessment analysis for the site using the distribution data for the disposal domain parameter to obtain a risk assessment (**page 10 column 2 first full paragraph also page 35 column 1 last paragraph "system characterization and hazard identification"**).

As per claim 31,

Rechard discloses the integration component being configured to determine whether the disposal domain parameter satisfies a criterion using the risk assessment (**page 10 column 2 last paragraph, determining whether the data meets requirements of 40 CFR 191; also page 36 section 8.3.2, quality assurance**).

As per claim 32,

Rechard discloses the criterion being at least one selected from the group consisting of a governmental regulation (**page 11 column 1 first full paragraph; also page 36 section 8.3 paragraph 1**) and a cost criteria (**page 38 column 2 second full paragraph**).

As per claim 33,

Rechard discloses the integration component being configured to generate an operational parameter using the data distribution for the disposal domain parameter (**page 6 last paragraph, "performance characterization" ; also page 35 column 1 last paragraph**).

As per claim 34,

Rechard discloses the integration component being configured to extract sensitivity study information associated with the disposal domain parameter from the disposal domain information (**page 37 column 1 last paragraph**).

Conclusion

18. The prior art made of record on the Form PTO-892 and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Thornewell whose telephone number is (571)272-6543. The examiner can normally be reached on 9am-5:30pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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